DIGITAL-AF: Results from a real-life digital population screening for atrial fibrillation using only a smartphone

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Introduction

• 25% lifetime risk for developing AF
• 14-17 million pts with AF in EU by 2030
• 1.5 to 2 – fold increase in mortality
• Treatment prevents morbidity/mortality
Screening for AF

• Opportunistic screening by pulse palpation or ECG in > 65yo (class I, level B)
• Systematic ECG screening in >75 yo or increased stroke risk (class I, level B)
• ECG and 72h monitoring (class I, level B) and prolonged monitoring (class IIa, level B) in TIA/stroke patients
Innovative technologies

• Dedicated ECG screening devices

• Long-term ECG monitoring

• Non-ECG technologies
Pulse Plethysmogram
Digital-AF study

World’s first medical approved smartphone app for heart rhythm disorders

Class IIa medical device
Digital-AF study

Clinical Validation

SINUS RHYTHM

Heart rate: 58 bpm
Constant RR-interval

AF

Heart rate: 98 bpm
Variable RR-interval

Simultaneous ECG – PPG
Close to 2000 pts
95,8% accuracy in 60 seconds

Digital-AF study

Local newspaper article
92 638 subscribers

Download the app
Create account
Scan QR-code

Information
60s recording
Symptoms

Steady position
2 measurements/day
1 week

Instant feedback
Centralized reviewing
Summary report

12 328
registered users
in 48 hours

120 446
60-second PPG traces
in 1 week
Digital-AF results

12,328 registered users in 48 hours

Age: 49 y +/- 14 y
M/F ratio: 58/42 %
75% is > 40 yo
Digital-AF results

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Age distribution general population
Digital-AF results

Automated Heart Rhythm Analysis

120,446 traces

98,586 normal rhythm

9,733 insufficient quality

12,127 possible irregularities

Reviewed by trained technicians
Digital-AF results

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615 atrial fibrillation in 136 participants
Digital-AF results
Digital-AF results

136 participants with AF

Age: 62 y +/- 11 y
M/F: 74%/26%
Higher BMI
76% asymptomatic

1.1% overall prevalence
Digital-AF results

136 participants with AF
1.1% overall prevalence
0.4% AF spot check
1.4% AF one week
38 persistent/permanent AF
98 paroxysmal AF
Digital-AF results

136 participants with AF
Follow-up questionnaire after 4 months

36 ptp no info

60 ptp with known Cardiac Arrhythmia

40 ptp with new AF

81 confirmed AF-cases
Digital-AF Conclusions

- World’s first mass screening for AF using a smartphone only
- Smartphone camera can obtain reliable PPG signal in a broad population
- More intensive screening results in higher diagnostic yield
- Majority of AF cases were asymptomatic
- Importance of secondary off-line analysis
- No clinical infrastructure needed, increased comfort for participants, cost efficient
Thank You 😊😊